

Homework #11
Honors Physics

1. A piano emits frequencies that range from a low of about 28 Hz to a high of about 4200 Hz. Find the range of wavelengths in air attained by this instrument when the speed of sound in air is 340 m/s.
2. A string is rigidly attached to a post at one end. Several pulses of amplitude 0.15 m sent down the string are reflected at the post and travel back down the string without a loss of amplitude. What is the amplitude at a point on the string where the maximum displacement points of two pulses cross? What type of interference is this?
3. At a maximum level of loudness, the power output of a 75-piece orchestra radiated as sound is 70.0 W. What is the intensity of these sound waves to a listener who is sitting 25.0 m from the orchestra?
4. The power output of a tuba is 0.35 W. At what distance is the sound intensity of the tuba $1.2 \times 10^{-3} \text{ W/m}^2$?
5. What are the first three harmonics of a note produced on a 31.0 cm long violin string if the waves on this string have a speed of 274.4 m/s?